

**DATA VALIDATION SOP**  
**RADIOCHEMICAL ANALYSES**

**ENVIRONMENTAL DATA SERVICES**

**RADIOCHEMICAL ANALYSES VALIDATION CHECKLIST (SOP)**

**SITE:**

**DATE:**

**SDG:**

**Y      N      N/A**

**Data Completeness and Deliverables**

Have any missing deliverables been received and added to the data package?

\_\_\_\_\_

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If the lab cannot provide them, note the effect on review of the data in the non-compliance section of the data assessment narrative.

**Validation Radiochemical Data**

The data validation criteria outlined in this section applies to radiochemical data obtained via beta and gamma spectrometry.

**RADIOCHEMICAL ANALYSES**

**Sample Receipt/Lab Case Narrative**

Are all chains-of-custody present for all samples?

\_\_\_\_\_

ACTION: If no, prepare Telephone Record Log and contact lab for submission of missing or illegible copies.

Do chain of custody records or lab case narrative indicate any problems with sample receipt , condition of samples, analytical problems or special circumstances affecting the quality of the data?

\_\_\_\_\_

Y N N/A

## Holding Times

Have any radiological technical holding times, determined from date of collection to date of analysis, been exceeded?

\_\_\_\_\_

The holding time for soil is 6 months from date samples were collected, with the exception of Be-7 (3 months).

## Table of Holding Time Violations

Sample ID	Sample Matrix	Preserved?	Date Sampled	Date Lab Received	Date Analyzed
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ACTION: If technical holding times are exceeded document in the Data Assessment Narrative that holding times were exceeded. If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re-analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage time on the data.

## Sample Replicate Analysis

Is a duplicate summary form present?

\_\_\_\_\_

Were replicates analyzed at the required frequency?

\_\_\_\_\_

One per twenty field samples analyzed by each system?

\_\_\_\_\_

ACTION: If no, prepare Telephone Record Log and contact laboratory for explanation/resubmittals. Note any impact on data quality in the Data Assessment Narrative.

Raw data present should include the following:

- A. Detector used
- B. Analyst initials
- C. Date analyzed
- D. Sample I.D.
- E. Value obtained for initial analyses
- F. Value obtained for replicate analyses
- G. Mean value
- H. Duration of counts in minutes
  - samples
  - background
- I. CPM's for samples and background

**Y            N            N/A**

Are all associated replicate values within allowable limits (overlap of the 2 sigma bands)?

\_\_\_\_\_

ACTION: Qualify associated data as estimated if the above criterion is not met.

### Blanks

Is a method blank summary present?

\_\_\_\_\_

Frequency of Analysis:

Has a reagent/method blank been analyzed for Pb-210 with each analytical batch?

\_\_\_\_\_

Has a blank container been counted by gamma detector each week associated samples are counted?

\_\_\_\_\_

ACTION: If any method blank data are missing, prepare a Telephone Record Log and contact lab for an explanation/ resubmittal. If method blank data are not available, reject all associated positive data. However using professional judgement, the data reviewer may substitute field blank or trip blank data for missing method blank.

### Contamination

Do any of the method/instrument/reagent blanks have positive results for radiological isotopes of concern?

\_\_\_\_\_

When applied as described below, the contaminant concentration in these blanks are multiplied by any dilution factor and corrected for % moisture.

ACTION: Prepare a list of samples associated with contaminated blanks.

**ACTION:** If a compound is found in a blank, but not found in the sample, no action is taken.

If a blank has a positive result for an analyte, qualify associated sample data as follows:

If the sample result is greater than the laboratory reporting limit but less than 5 times the blank concentration, flag the sample result as a non-detect ('U'). If the sample result is reported as detected at a concentration less than the reporting limit and less than 5 times the blank concentration, qualify the sample result as not-detected at the laboratory reporting limit. For aqueous blanks applied to soil/sediment samples, compare the sample result to the equivalent concentration of the blank. The equivalent concentration is determined by assuming all of the analyte present in the blank aliquot analyzed is present in the sample aliquot analyzed.

The reviewer should note that the blank analyses may not involve the same weights, volumes, or dilution factors as the associated samples. These factors must be taken into consideration when applying the 5x criteria, such that a comparison of the total contamination is actually made.

## Target Analytes

Are the radiochemical analysis data summaries present (example: Form I RAD) with required header information, for each of the following:

- |    |  |       |       |       |
|----|--|-------|-------|-------|
| a. | Samples and or fractions as appropriate? | _____ | _____ | _____ |
| b. | Duplicates?                              | _____ | _____ | _____ |
| c. | Blanks?                                  | _____ | _____ | _____ |

Are the radiological raw data including beta and gamma instrument printouts and calculations in the sample package for each of the following:

- |    |  |       |       |       |
|----|--|-------|-------|-------|
| a. | Samples and/or fractions as appropriate? | _____ | _____ | _____ |
| b. | Duplicates?                              | _____ | _____ | _____ |
| c. | Blanks?                                  | _____ | _____ | _____ |

**ACTION:** If any data are missing prepare Telephone Record and contact lab to obtain explanation/resubmittals. Note any impact on the data quality in the Data Assessment Narrative.

**Y      N      N/A**

### Analyte Quantitation and Reported Detection Limits

Are there any transcription/calculation errors in data summary results? \_\_\_\_\_

Check at least two positive values. Were any errors found? \_\_\_\_\_

Are the LLD adjusted to reflect sample dilutions? \_\_\_\_\_

ACTION: If errors are large, contact lab for explanation/ resubmittal, make any necessary corrections and note errors in the Data Assessment Narrative.

### BETA Spectrometry Initial Calibration

Are the initial calibration summary forms present and complete for each detector used to quantitate samples? \_\_\_\_\_

Are the following records present for each detector used:

Identification of Detection? \_\_\_\_\_

Analysts initials? \_\_\_\_\_

Date and time of calibration? \_\_\_\_\_

Name/Activity/Date of certified NBS material? \_\_\_\_\_

Counts per minute? \_\_\_\_\_

Duration of counting? \_\_\_\_\_

Calculated Efficiencies? \_\_\_\_\_

ACTION: Contact the laboratory for submission of any missing data .

Are efficiencies of each detector used greater than 15%? \_\_\_\_\_

\_\_\_\_\_

ACTION: Qualify as estimated results associated with a non-compliant calibration.

Y      N      N/A

### BETA Spectrometry Continuing Calibration

Are the continuing calibration summaries present and complete? \_\_\_\_\_

Has a continuing calibration standard been analyzed twice every week of sample analysis per instrument? \_\_\_\_\_

ACTION: List below all sample analysis that were not within one week of the previous continuing calibration set.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

ACTION: If any forms are missing or if a continuing calibration standard was not analyzed twice during each week of every sample analysis, prepare Telephone Log and contact lab for explanation/resubmittal.

Are the following continuing calibration records present for each detector used:

Control charts and logs defining check source results. \_\_\_\_\_

ACTION: Contact laboratory for submission of any missing data.

Are the check source count rates within three standard deviations of the mean? \_\_\_\_\_

ACTION: Qualify as estimated results associated with a non-compliant calibration.

### Recovery Factors

For the Lead-210 analyses is the chemical recovery or yield greater than 20%? \_\_\_\_\_

ACTION: Reject all associated data if recovery is less than 20%.

Y      N      N/A

### GAMMA Spectrometry Continuing Calibration

Are the continuing calibration summaries present and complete? \_\_\_\_\_

Has a continuing calibration standard been analyzed twice during each week of sample analysis per instrument? \_\_\_\_\_

ACTION: List below all sample analysis that were not within one week of the previous continuing calibration set.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

ACTION: If any forms are missing or if a continuing calibration standard was not analyzed twice during each week of every sample analysis, prepare Telephone Log and contact lab for explanation/resubmittal.

Are the following continuing calibration records present for each detector used:

Control charts and logs defining check source results and efficiency limits? \_\_\_\_\_

Blank results for background control (gamma only)? \_\_\_\_\_

ACTION: Contact laboratory for submission of any missing data.

Are efficiencies of selected energies within three standard deviations of the mean? \_\_\_\_\_

Are the resolutions of each peak less than 5 KEV? \_\_\_\_\_

ACTION: Qualify as estimated sample results associated with non-compliant calibrations.



Y      N      N/A

### Field Duplicates

Were any field duplicates submitted for radio chemical analysis?

\_\_\_\_\_

ACTION: Where both the sample and duplicate values are greater than 5 times the SQL, acceptable sampling and analytical precision is indicated by an RPD for the two field duplicate results of less than or equal to 100 percent. Where one or both analytes of the field duplicate pair are less than 5 times the SQL, satisfactory precision is indicated if the field duplicate results agree within 2.5 times the SQL. If the above criteria are not met for an analyte, qualify all associated sample data for that analyte as estimated ('J').

SOP RAD-1  
Prepared 8/05  
REV: 3

**ITEMS MARKED THROUGHOUT THE DOCUMENT WITH AN \***